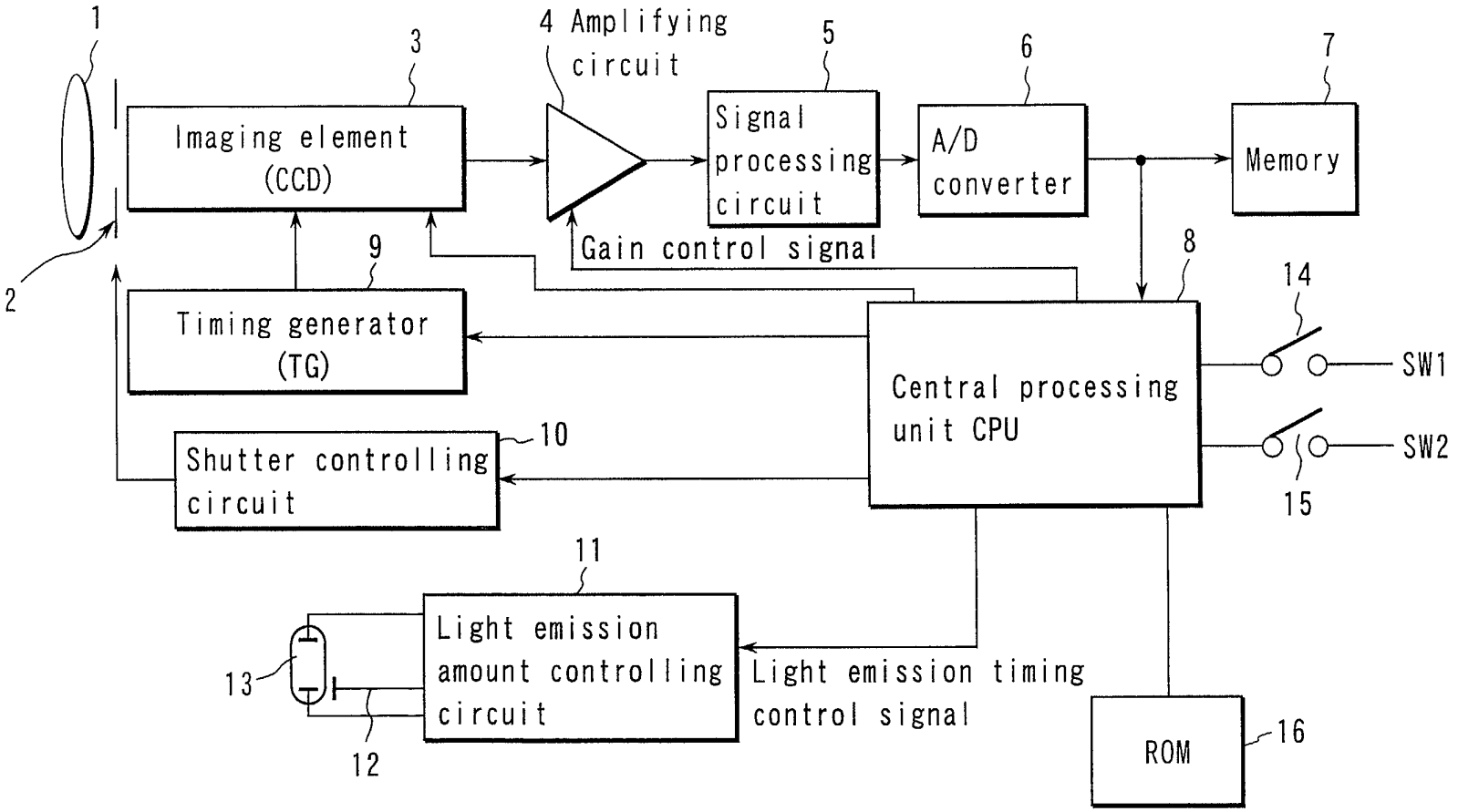
1
2
3
Imaging element (CCD)
4 Amplifying circuit
5
Signal processing circuit
6
A/D converter
7
Memory
Gain control signal
8
9
Timing generator (TG)
14
Central processing unit CPU
SW1
SW2
15
10
Shutter controlling circuit
11
Light emission amount controlling circuit
13
12
Light emission timing control signal
ROM
16

FIG. 1

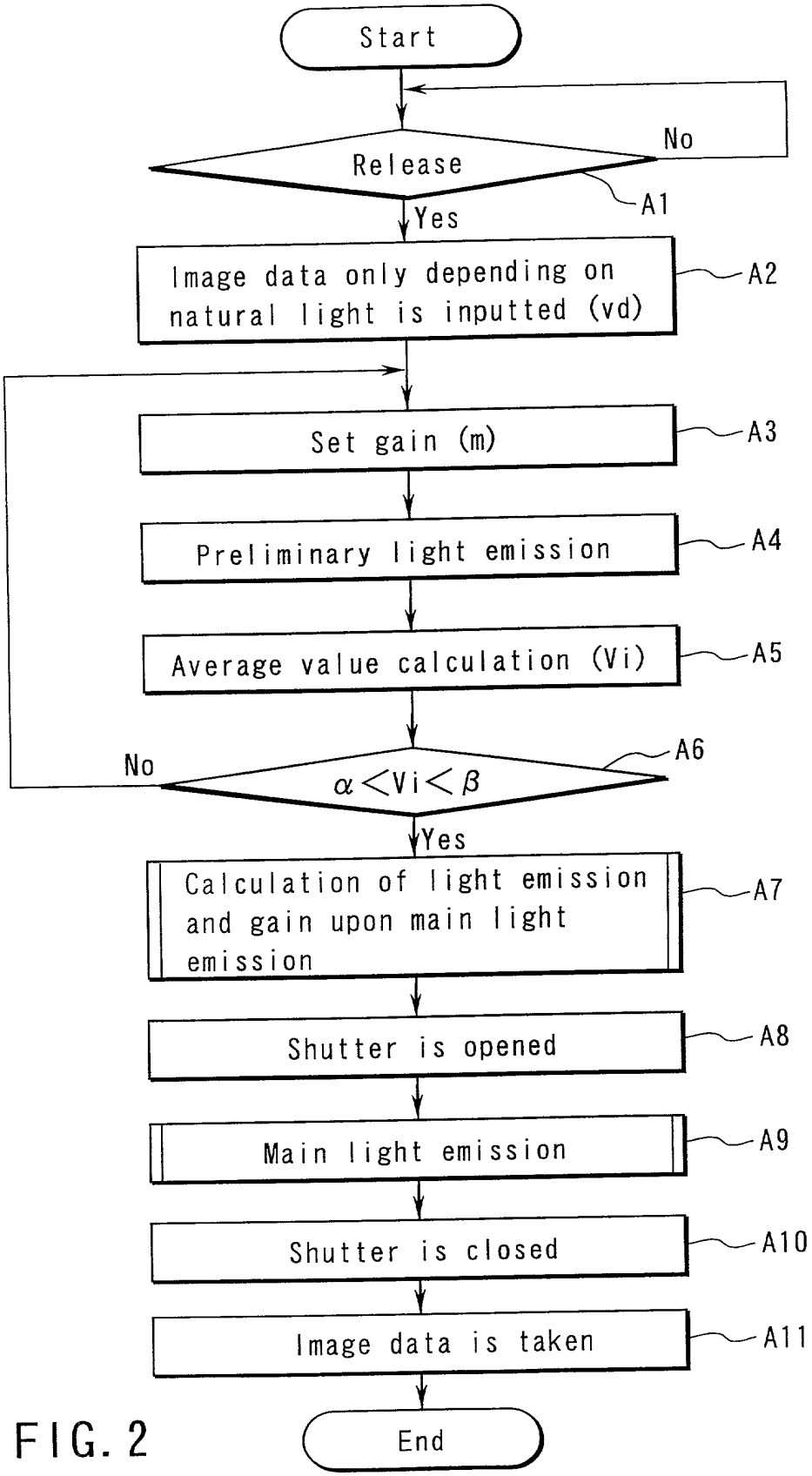
Start
Release
No
A1
Yes
Image data only depending on natural light is inputted (vd)
A2
Set gain (m)
A3
Preliminary light emission
A4
Average value calculation (Vi)
A5
No
α<Vi<β
A6
Yes
Calculation of light emission and gain upon main light emission
A7
Shutter is opened
A8
Main light emission
A9
Shutter is closed
A10
Image data is taken
A11
End

FIG. 2

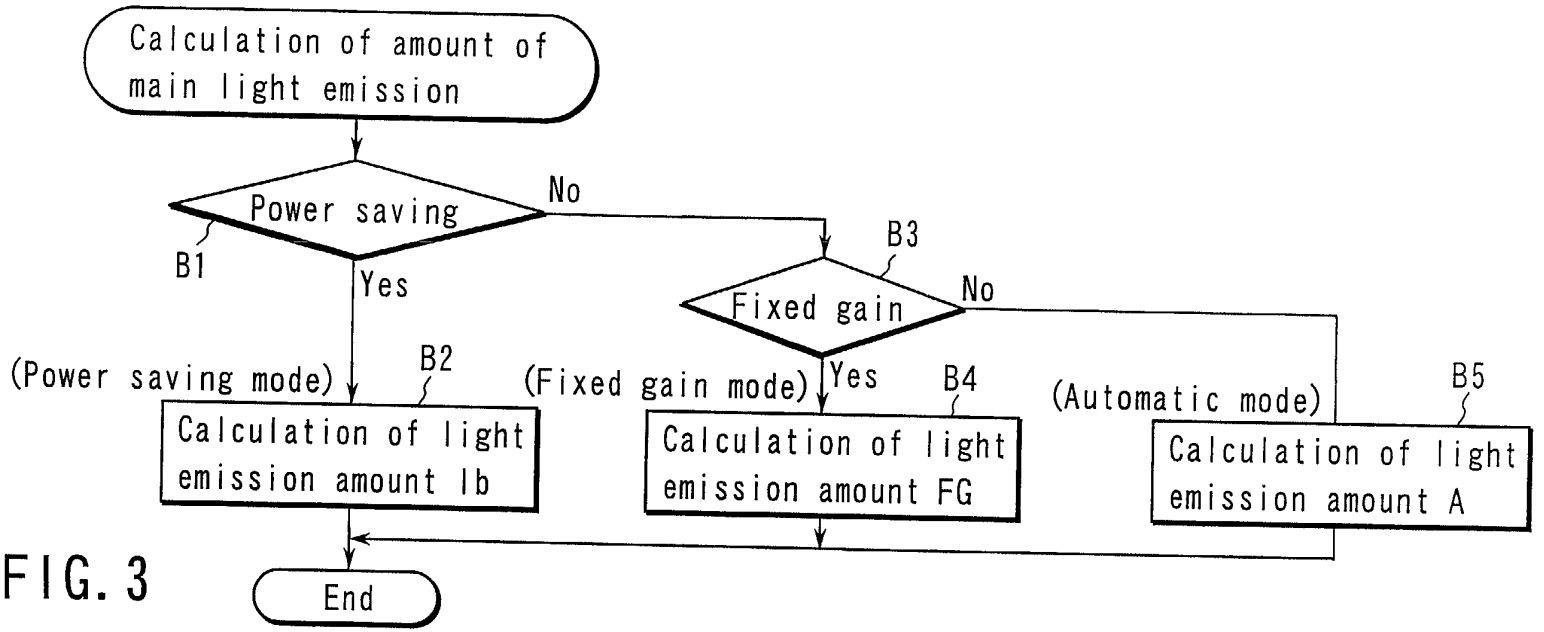
Calculation of amount of main light emission
Power saving
No
B1
Yes
B3
Fixed gain
No
(Power saving mode)
B2
(Fixed gain mode)
Yes
B4
(Automatic mode)
B5
Calculation of light emission amount Ib
Calculation of light emission amount FG
Calculation of light emission amount A
End

FIG. 3

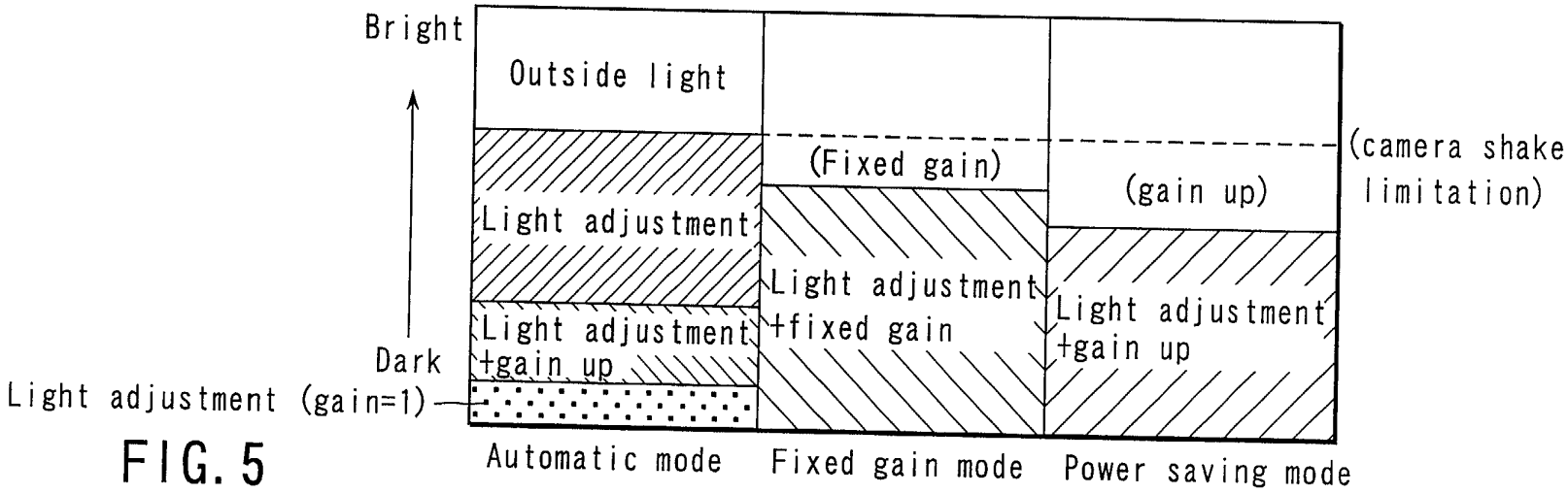
Bright
Dark
Outside light
(Fixed gain)
(gain up)
(camera shake limitation)
Light adjustment
Light adjustment +fixed gain
Light adjustment +gain up
Light adjustment (gain=1)
Automatic mode
Fixed gain mode
Power saving mode

FIG. 5

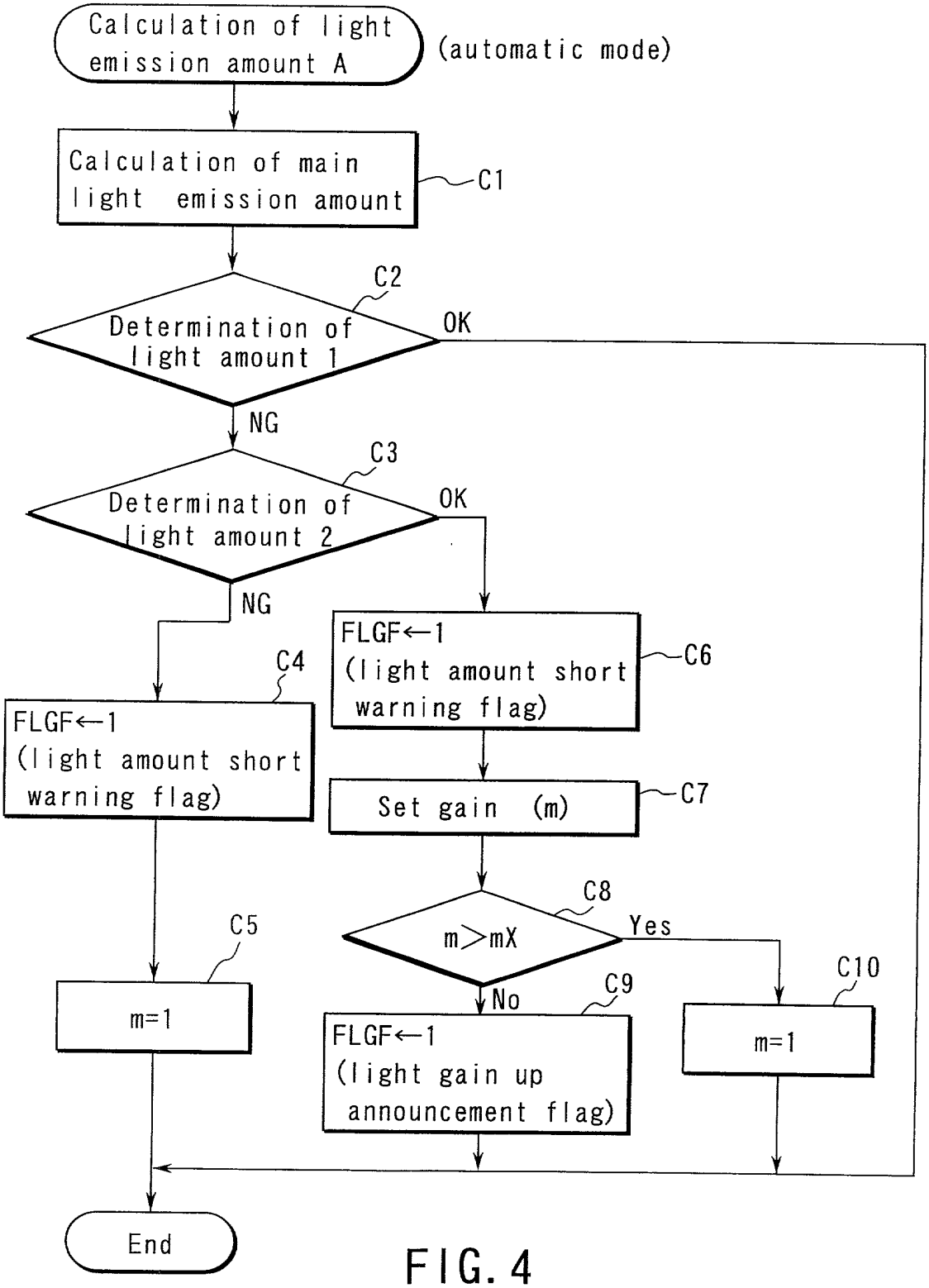
Calculation of light emission amount A
(automatic mode)
Calculation of main light emission amount
C1
C2
Determination of light amount 1
OK
NG
C3
Determination of light amount 2
OK
NG
C4
FLGF←1 (light amount short warning flag)
C5
m=1
C6
FLGF←1 (light amount short warning flag)
C7
Set gain (m)
C8
m>mX
Yes
No
C9
FLGF←1 (light gain up announcement flag)
C10
m=1
End

FIG. 4